

1. A cultured skin device comprising cultured dermal cells on a biocompatible reticulated matrix, the dermal cells providing a lamination layer for cultured epidermal cells thereon.
2. The device of claim 1 wherein the epidermal cells are selected from the group consisting of keratinocytes, melanocytes, immunocytes, stem cells, and combinations thereof.
3. The device of claim 1 wherein the dermal cells are selected from the group consisting of fibroblasts, endothelial cells, immunocytes, nerve cells, myocytes, stem cells, and combinations thereof.
4. The device of claim 1 for therapy in a patient with a burn, a burn scar, a chronic skin ulcer, a congenital skin lesion, a metabolic disease, a protein defect, a protein deficiency, and combinations thereof.
5. The device of claim 1 wherein the matrix is comprised of collagen.
6. The device of claim 1 wherein the matrix consists essentially of collagen.

- Phragmites australis*, *Spartina patens*, *Spartina alterniflora*, *Cyperus tenuiflorus*, *Juncus roemerianus*, *Sagittaria arifolia*, *Najas*, *Chara*, *Elodea canadensis*, *Potamogeton amplifolius*, *Vallisneria spiralis*, *Utricularia*, *Scheuchzeria palustris*, *Sparganium angustifolium*, *Scirpus americanus*, *Sagittaria arifolia*, *Najas*, *Chara*, *Elodea canadensis*, *Potamogeton amplifolius*, *Vallisneria spiralis*, *Utricularia*, *Scheuchzeria palustris*, *Sparganium angustifolium*, *Scirpus americanus*.

10. A method of producing a cultured skin device comprising inoculating a biocompatible reticulated matrix with cultured dermal and epidermal cells, and incubating said inoculated matrix under conditions sufficient to form a cultured skin device.
11. The method of claim 10 wherein conditions comprise incubating in a medium containing a component selected from the group consisting of insulin, at least one essential fatty acid, vitamin C, and combinations thereof.
12. The method of claim 11 wherein insulin is at a concentration in the range of about 0.05  $\mu\text{g/ml}$  to about 500  $\mu\text{g/ml}$ .
13. The method of claim 10 wherein the dermal cells are inoculated prior to inoculating the epidermal cells.
14. The method of claim 10 wherein the matrix comprises collagen.
15. The method of claim 10 wherein the matrix consists essentially of collagen.
16. The method of claim 10 wherein the epidermal cells comprise melanocytes and the cultured skin composition restores skin pigmentation.

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- 5 18. A method of producing a cultured skin device comprising isolating at least a first cell type from skin, culturing the isolated cells, and inoculating the cultured cells to a biocompatible reticulated matrix by a method selected from the group consisting of submerged inoculation and lifted inoculation, and incubating said inoculated matrix under conditions to form at least one cellular population.
19. The method of claim 18 further comprising inoculating said matrix with a second cell type.
20. The method of claim 18 wherein the cell type is selected from the group consisting of dermal cells, epidermal cells, and combinations thereof.
21. The method of claim 18 wherein the cells are from a recipient of the skin device.
22. The method of claim 18 wherein the cells are selected from the group consisting of allogeneic, autologous, and xenogeneic.
23. The method of claim 18 wherein the cultured skin device is chimeric in genotype.

24. A method for producing a permanent cultured skin device for a burn patient comprising

isolating at least one dermal cell type and/or at least one epidermal cell type from an uninjured area of skin from a burn patient,

5 separately culturing the isolated dermal and/or epidermal cells,

inoculating a biocompatible reticulated matrix with the cultured dermal and/or epidermal cells and incubating the inoculated matrix under conditions to form a cultured skin device within one month after inoculating the cells, and

10 providing the device to the patient.

25. The method of claim 24 wherein the dermal cells are selected from the group consisting of fibroblasts, endothelial cells, immunocytes, nerve cells, myocytes, stem cells, and combinations thereof, and the epidermal cells are selected from the group consisting of keratinocytes, melanocytes,

5 immunocytes, stem cells, and combinations thereof.

26. The method of claim 24 wherein the cultured skin device restores an epidermal barrier function.

27. The method of claim 24 wherein the cultured skin device is vascularized within two to seven days of surgical application.

28. A cultured skin device prepared by a method comprising  
isolating at least one dermal cell type or at least one epidermal  
cell type from skin,

separately culturing the isolated dermal and epidermal cells,

5 providing the cultured dermal cells to a biocompatible reticulated

matrix and incubating in Dulbecco's modified Eagle's medium containing

strontium chloride (0.01 mM to 100 mM); linoleic acid/BSA (0.02 µg/ml to 200

µg/ml); insulin (0.05 µg/ml to 500 µg/ml); triiodothyronine (0.2 pM to 2000 pM);

hydrocortisone (0.005 µg/ml to 50 µg/ml); a combination of penicillin

10 (100 U/ml), streptomycin (100 µg/ml), amphotericin (0.25 µg/ml); ascorbic

acid-2-phosphate (0.001mM to 10 mM), progesterone (0.1 nM to 1000 nM)

and epidermal growth factor (0.01 ng/ml to 100 ng/ml) for about 24 hours, and

thereafter providing the cultured epidermal cells on the

lamination layer of dermal cells to form the cultured skin device.

29. A method of producing a cultured skin device comprising  
inoculating a biocompatible reticulated matrix with cultured  
dermal cells,  
incubating the inoculated matrix under conditions to form a  
5 lamination layer of dermal cells,  
inoculating cultured epidermal cells on the dermal cell lamination  
layer, and  
incubating under conditions sufficient to form a cultured skin  
device.

30. The method of claim 29 wherein said matrix is dehydrated to  
form a crosslinked matrix before inoculating with cultured dermal cells.

31. The cultured skin device of claim 29 wherein the matrix is  
comprised of collagen.

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32. A method of inoculating a matrix with a cell suspension comprising

providing a reticulated matrix overlying an absorbent material, the material saturated with a cell culture medium,

5 thereafter providing cells suspended in a volume of culture medium to a top surface of the matrix under conditions sufficient to draw the medium through the absorbent material and deposit the cells in the matrix.

33. The method of claim 32 wherein the undersurface of the reticulated matrix is in contact with a substantially non-adherent, non-cytotoxic surface.

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